

Patent Claims

1. An apparatus for holding an optical assembly in an imaging device which has a number of optical assemblies, in particular for holding a lens group in an objective, characterized in that the optical assembly (12) is suspended via at least one decoupling element (14, 14', 16) in at least one area in a supporting structure (13), wherein the resultant effect of the at least one decoupling element (14, 14', 16) in the at least one area is to impede possible movement in terms of rotation or translation in at least one suitable one of three orthogonal spatial directions, thus resulting in at least one statically defined bearing.
2. The apparatus as claimed in claim 1, characterized in that the optical assembly (12) is suspended via the decoupling elements (14', 16) in at least two different areas in the supporting structure (13), wherein the resultant effect of the decoupling elements (14', 16) in each area is stiff in terms of rotation or translation in at least one suitable one of three orthogonal spatial directions, thus resulting in at least one statically defined bearing.
3. The apparatus as claimed in claim 2, characterized in that the objective (7) is in the form of a catadioptric objective for a projection exposure system (1) for microlithography.
4. The apparatus as claimed in claim 2, characterized in that the decoupling elements (14') in the one area in which the load is passed to the supporting structure (13) is stiff in the spatial direction at least approximately parallel to

the force of gravity (g), wherein the optical assembly (12) is suspended in the other area in the supporting structure (13) via a combination of tangentially stiff decoupling elements (19) and a membrane (17).

5. The apparatus as claimed in claim 2, characterized in that the tangentially stiff decoupling elements (19) and the membrane (17) are connected via a stiff intermediate element (18).

6. The apparatus as claimed in claim 1 or 2, characterized in that the decoupling elements (14', 16) are in the form of leaf spring elements.

7. The apparatus as claimed in claim 2, characterized in that the decoupling elements (14') are stiff in the spatial direction at least approximately parallel to the force of gravity (g) in the one area in which the load is transmitted to the supporting structure (13), wherein the suspension of the optical assembly (12) in the supporting structure (13) in the other area is provided via a large number of tangentially stiff, axially and radially soft elements.

8. The apparatus as claimed in claim 6 or 7, characterized in that the position of the areas, the alignment of the leaf spring elements and the spring stiffness of the leaf spring elements are chosen such that a first natural form of the oscillation rotates about a point (P3) on the assembly (12) which is neutral with respect to optical sensitivity.

9. The apparatus as claimed in one of claims 1 or 2, characterized in that the decoupling elements (14', 16) are cho-

sen such that thermal expansions between the supporting structure (13) and the assembly (12) do not lead to mechanical forces.

10. Use of an apparatus as claimed in one of claims 1 to 9 in a projection exposure system (1) for microlithography.